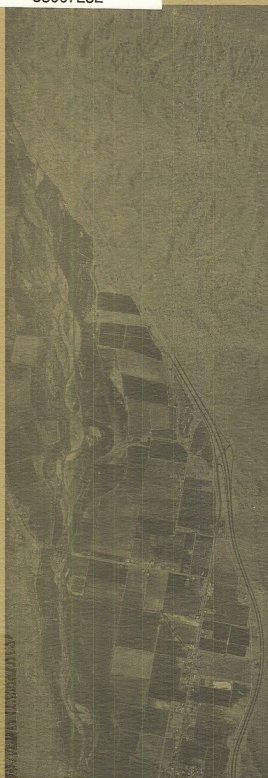




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ANALYSIS OF AGRICULTURAL POTENTIAL FOR DESERT LAND ENTRIES IN NEVADA

BY
JUDY E. NELSON
REGIONAL ECONOMIST
MAY 1979

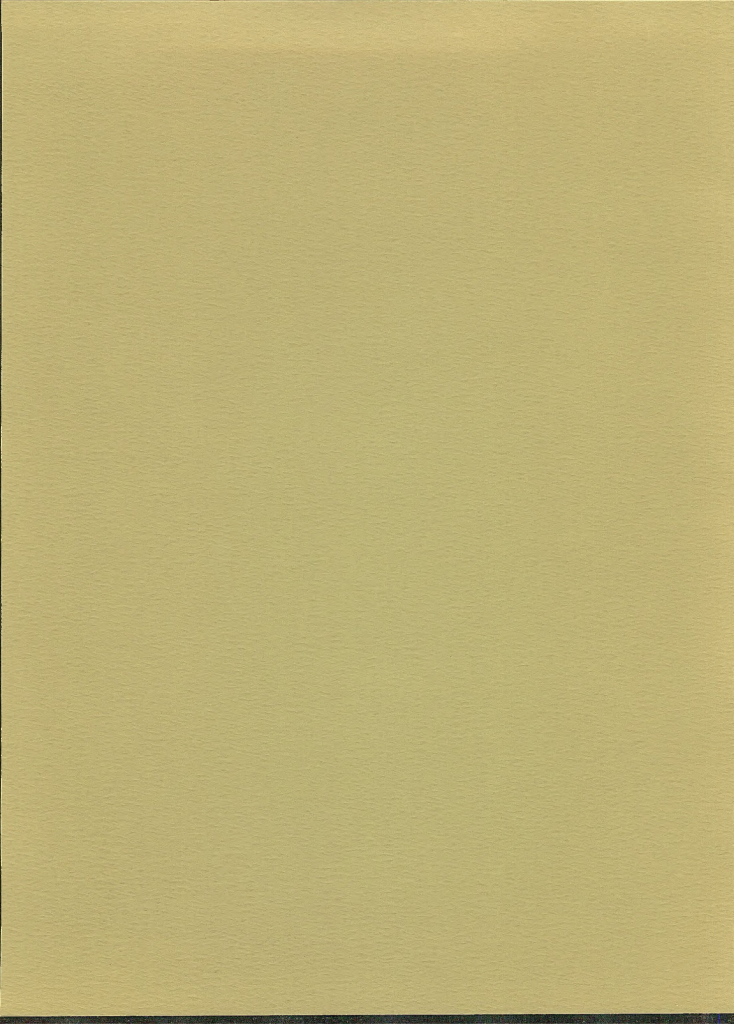


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IN
NEVADA

Judy E. Nelson
Regional Economist
Bureau of Land Management
Reno, Nevada
May, 1979

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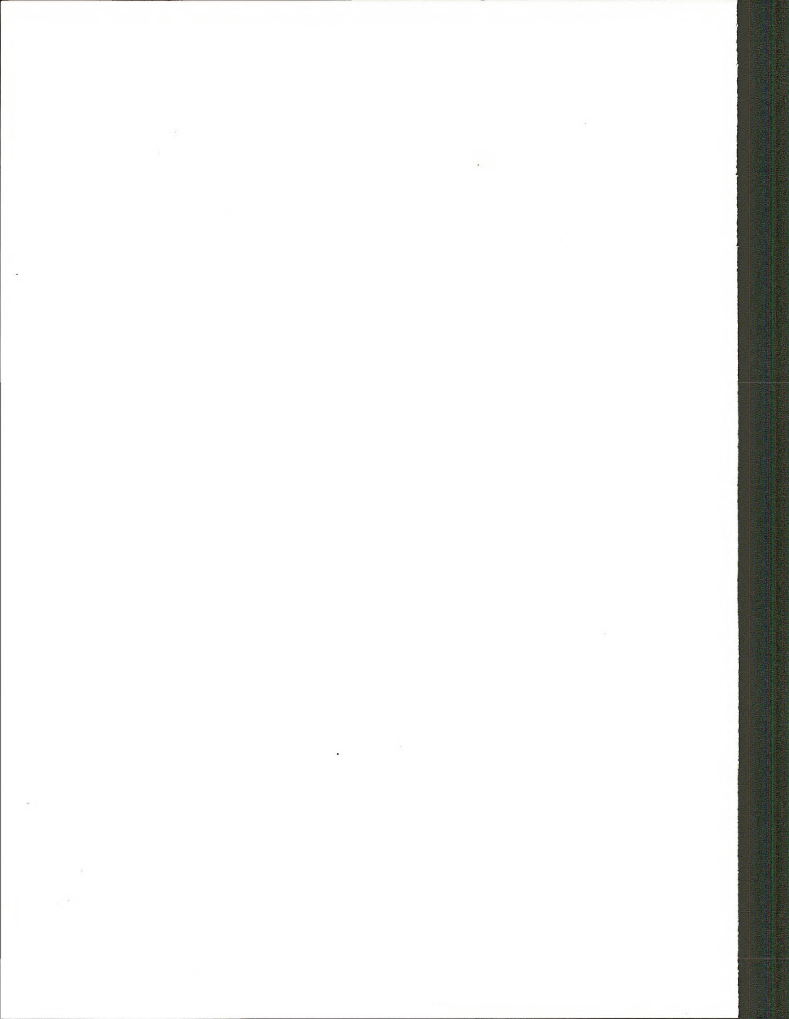


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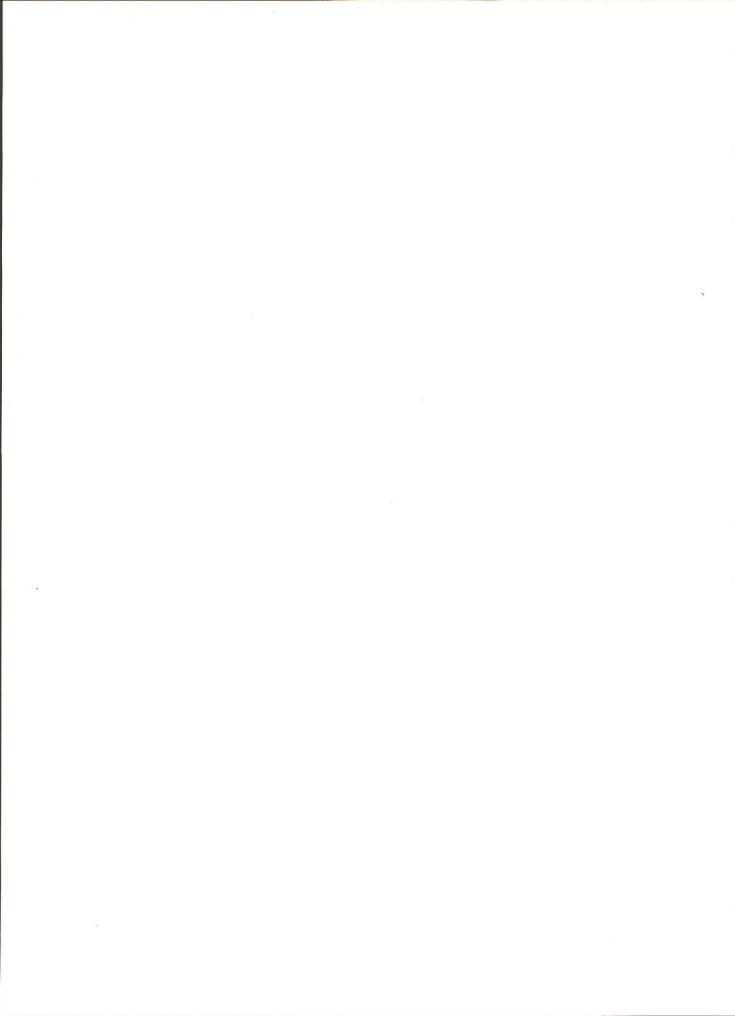
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INTRODUCTION

For the most part, farming in the arid West is accomplished with the use of irrigation, and irrigation has always been a relatively expensive proposition. The Desert Land Entry Act was passed by Congress in 1877 in recognition that land must be held in larger quantities than available through the Homestead Act to justify the expense of irrigation. The 1877 Desert Land Entry Act provided that an individual could receive 640 acres for \$1.25/acre for the purpose of reclaiming the land for agriculture through the application of water. Amendments in 1891 and 1915 reduced the acreage to 320 acres (640 for a family) and contained specific requirements for irrigation.

During the most active period for filing of Desert Land Entries (DLE) in Nevada (1950-1964), 7,152 applications were received. On June 4, 1964, the Secretary of the Interior closed the State of Nevada to petition filings under the various agricultural entry acts: Desert Land, Homestead, and Pittman Acts. The reason for the closure was concern about appropriation of water in some valleys due to the agricultural entries. The closure was to allow time for assessment, in an orderly fashion, of the water availability and agricultural potential of the valleys.

The moratorium on Desert Land Entries was lifted in Nevada on January 1, 1979, as a result of litigation filed by the State of Nevada. In the first 90 days after the moratorium was lifted, the Bureau of Land Management's (BLM) Nevada State Office responded to over 8,000 inquiries on DLEs. During the initial 90 day filing period (January 2 - April 2, 1979) 1,745 applications were received.

This paper assesses the economics facing the potential DLE applicant in Nevada. In order to understand the present situation, a brief background on Nevada agriculture and a history of DLEs in Nevada is presented.

An analysis of the costs and returns associated with DLEs follows. The DLE applicant is faced with a wide range of variables including such factors as prices received for products; costs of inputs; and physical conditions such as climate, soil, and water availability. Given the number of variables, the analysis developed remains general with an income level determined by the most probable set of variables. The effects of changes in the variables is also discussed.

AGRICULTURE IN NEVADA

Currently there are approximately 2,000 farms in Nevada. (Farms include "ranches".) Nevada follows national trends with the total number of farms steadily declining. From 1940 to 1974, the number of farms decreased by 1,497, a decline of 45 percent. The total number of private acres in farms increased during the same period from 3,785,106 to 10,813,610 acres. In 1974 the average size of a farm in Nevada was 5,209 acres, although the median size was in the 260 to 499 acre category (20, p. I-1).*

The majority of land in farms is pasture or rangeland. Harvested cropland in Nevada has always been a small proportion of farm land, ranging from 12 percent of the total acreage in 1940 to 7 percent of the total acreage in 1974. In absolute numbers, total cropland increased from 435,855 acres in 1940 to 551,300 acres in 1974 (26 percent increase). Irrigated land, which includes irrigated pasture, increased only 3 percent during the same period (from 755,636 acres in 1940 to 777,510 acres in 1974) (20, p. I-1). These trends are shown in Illustration 1 and Table 1.

Reasons for lack of agricultural development in Nevada include: limited precipitation which results in little water availability for agriculture; lack of surface water which can be used for irrigation; a harsh climate with a short growing season in much of the State; rugged topography; alkaline soils in many valleys; and distance from major markets. Also, land ownership patterns are sometimes cited as a reason for lack of development. This reason can be discounted because of the small proportion of private land that is currently cultivated and the limited success of agricultural entry programs. The latter is discussed in the next section.

Agriculture in Nevada has traditionally centered on the livestock industry, which accounts for 67 percent of the value of agricultural products sold in 1974. Only 52 percent of the value of crops produced were sold; the majority of the remaining crops were used as livestock feed. Hay accounted for 67 percent of the total value of crops in 1974 (20, p. I-5). In 1977, hay's proportion dropped to 60 percent of the value of production with alfalfa seed (12 percent of value) and potatoes (17 percent of value) accounting for the majority of the remainder. Potatoes are a major new crop in Nevada; thus, acres in potatoes were not reported prior to 1973. In 1974, 8,500 acres were in potatoes; in 1976 this grew to 14,000 acres. In 1978, 17,000 acres were in potatoes (14, p.3)(9). Table 2 shows major crops and the value of production for 1977.

Agricultural income has fluctuated widely in Nevada since 1970 (Illustration 2). Farm income reached an all-time high in 1973 with an

* References are cited as numbered in the Bibliography. On occasion, specific pages are also noted.

average income of \$27,000. Average income dropped to \$6,049 in 1977 (14, p. 23). Income received by farmers in Nevada is highly correlated with price fluctuations in the livestock industry. These fluctuations become even more dramatic when data from the individual counties are examined (Tables 3 and 4). Lander, Eureka, Lincoln, and Nye Counties showed a net negative farm proprietors' income from 1974 to 1976. Elko and White Pine Counties both had negative farm proprietors' income in 1976. This means many ranchers either had to support their ranch with outside income or previous earnings, increase their indebtedness, or go out of business. Counties that are not as dependent on the cattle industry avoided much of the fluctuation in farm income experienced by the "cow counties". Income in Churchill, Pershing, Humboldt, Douglas, and Lyon Counties showed the most stability. In Nevada in 1974 54 percent of the farmers were reported as working off the farm with 32 percent reporting over 200 days of off-farm work (16, p. 1-2).

Table 5 shows agriculture in Nevada in comparison with the surrounding states. Nevada has the smallest number of farmers, and the second largest average acreage per farm. Average annual income per farm in Nevada has been the most variable of the states. In terms of total agricultural cash receipts, Nevada is a small contributor to the regional picture with only 39 percent of the value of receipts of Utah (on similar acreage) and only 2 percent of the value of receipts of California in 1977 (13, p. 463). California, however, is the nation's largest agricultural producer.

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DESERT LAND ENTRIES IN NEVADA

Since 1877, 376,388 acres have been transferred to 1,687 private citizens through the Desert Land Entry Act in Nevada. Table 6 shows the acreage involved in agricultural transfers under the Desert Land Entry and Homestead Acts for Nevada and the surrounding states. Total land transferred under these acts in Nevada was considerably less than land transferred in other western states.

It was the intent of these acts to make land easily available as an incentive for settlement in the West. The low rate of transfer in Nevada can be explained by several factors. First, agriculture in Nevada is constrained by the availability of water. Nevada has the lowest average rainfall of any state. This limited precipitation generally falls as snow in the winter instead of rain during the growing season. There are few rivers in Nevada that have year-round water, and the annual yield of groundwater is also limited by the lack of precipitation. The State obtained title to lands surrounding most of the available surface water by relinquishing their rights to school grant lands in 1880. The State land, in turn, was sold to stockmen and is not available to agricultural entry.

Other major factors are rugged topography and distance to major markets. The costs associated with marketing have historically put Nevada at a comparative disadvantage. Climatic conditions and a short growing season in the northern portion of the State also contribute to a lack of agricultural development. A final factor is the poor alkaline soils found in many valley bottoms.

Applications for DLEs have followed definite trends. Nationally, activity was heavy after the initial passage of the Act with over a half million applications being filed per year in the first decade. Requirements for irrigation were not spelled out and many entries were for the purpose of obtaining control over stock water. Many acres of sub-irrigated meadows were claimed during this period. In 1891 and 1915 amendments to the Act were passed to correct these abuses by reducing the acreage to 320 acres, requiring a \$3.00/acre investment, and calling for cultivation of one-eighth of the entry with systems capable of irrigating 80 percent of the entry.

In Nevada from 1877 to 1923, 611,328 acres were entered with only 143,077 acres being patented. No easy method exists to segregate the effects of DLEs from other agricultural developments. A summary of Nevada land tenure in 1926 shows that stockmen owned 68 percent of the private land, exclusive of railroad lands, and leased 98 percent of the railroad land. Of the 362,522 acres of harvested cropland reported in the 1925 Agricultural Census, 94 percent produced either hay or other forage.

Activity under the Act was limited in the period preceding World War II. Land that was readily irrigated with surface water had already passed into private ownership. After World War II, however, high land prices,

high incomes, and technology to pump groundwater all contributed to renewed interest in DLEs. Applications filed from 1950 to 1964 resulted in 187,051 acres patented in the State, over 50 percent of the total of all Nevada DLE acres.

Another rise in the number of applications occurred in the late 1950s as a result of heavy promotional activity. In 1958, 846 applications for DLEs were filed in contrast to 136 applications filed the previous year. Increased interest continued with 1,613 applications filed in 1959 and 895 applications filed in 1960. Activity was also heavy nationally in this period as a result of promotional activity in DLEs and other agricultural entry acts. Because of a large backlog of applications the Secretary of the Interior declared a moratorium on applications for all kinds of homesteading on public lands which lasted from February 14, 1961, to September 4, 1962. Heavy filings on DLEs resumed with the lifting of the moratorium and continued until discontinued in Nevada by the Secretary of the Interior in 1964. All pending applications were to be resolved on their merit. Table 7 shows applications filed during this period and their resolution.

In the filing period from 1950 to 1964, 7,152 applications for DLEs were received. Of these, only 1,293 applications were allowed on 348,388 acres, a success rate of 18 percent. Many of the applications were ill-conceived and some were fraudulent. Private lands, lands on hill-sides, and lands with no potential water were in the filings. Nevada is the only state in which non-residents can apply, and a survey conducted of applicants between 1954 and 1959 showed that 90 percent were non-residents. The situation resulted in the Nevada State Senate petitioning the Congress of the United States (Nev. Stats., 933, (1959)) to repeal Desert Land Entry Acts. Nevada was closed to filing petition applications by the Secretary of the Interior on June 4, 1964.

It is interesting to speculate on the impact of the Desert Land Entry Act on agriculture in Nevada. The Act has not prevented the decline in the number of farms in Nevada. A study made in 1962 showed that of the DLE land patented between 1950 and 1959, 56 percent was still used in part-time farms, 22 percent was used for non-farm purposes, and 22 percent had been abandoned (21, p. 43). No recent studies exist to show if these trends are continuing.

Table 1 shows that harvested cropland declined in Nevada from 1940 to 1959 by 98,326 acres (23 percent). From 1959 to 1964, harvested cropland increased 16,686 acres (50 percent). Undoubtedly, part of the increase was a direct result of the heavy DLE activity during that period. The total increase in harvested acres from 1945 to 1974 was 64,458 acres which represents 34 percent of the 187,903 acres patented under the Desert Land Entry Act in the same period.

There are no clear trends in total irrigated acres (including non-cultivated pasture). Irrigated acreage peaked in 1964 at 824,515 acres after having reached a low in 1959 of 542,976 acres. The increase in

irrigated acres in this period was probably due in part to heavy DLE activity. Irrigation in Nevada is highly dependent on surface water, and changes in the availability due to lack of precipitation accounts for much of the variation in acreage. In 1974, only 21,874 net additional acres had been irrigated since 1940. This represents 12 percent of the 188,700 acres patented under the Desert Land Entry Act in the same period. The implication of these statistics is that the Desert Land Entry Act has had little impact on total irrigated acreage in Nevada although it might have affected the location of the existing acreage.

ASSUMPTIONS USED IN ECONOMIC ANALYSIS

Simulated crop budgets were used to analyze the economics facing a DLE applicant. Crops analyzed are alfalfa hay, alfalfa seed, potatoes, and wheat. If wild hay is excluded, these crops represent 97 percent of the acreage and the majority of the value of crops produced in the State. Budgets developed are based on preliminary budgets prepared by the University of Nevada, Division of Agricultural and Resource Economics, and represent the most current information on the economics facing existing farmers. To cover the situation faced by new farmers, current costs of establishing a well and an irrigation system were developed. Total costs were then compared with the income based on yields likely in different parts of the State to arrive at net income. Specific items that deviate from the University budgets are discussed in greater detail below.

Irrigation and Land Development Costs

Irrigation and land development costs are the major cost items facing the DLE applicant. Preparation of the land, the development of a deep well irrigation system, and fuel costs for the system run as high as \$90,000 annually (\$300 per acre annually). Costs are shown in Table 8 - 9 and each of these cost items is discussed separately below.

Land development costs include land clearing, grading, and fencing costs. Land clearing and grading costs are the most site dependent of all of the costs discussed. A value of \$100/acre was assigned for clearing and grading costs. There is a tradeoff between land development costs and irrigation costs. If three to five feet of topsoil exist, moderately rough land could be graded to permit use of a surface irrigation system. In this situation, irrigation costs would decrease, but land costs would increase. Because of the site specificity of the variables involved, a detailed analysis would have to be made for each location to analyze tradeoffs. Fencing costs were estimated at \$2,100 per mile.

Choice of an irrigation system depends on characteristics of the soil (water intake rate) and the area's topography. If the land is level (0.5 percent slope for a border system to 3 percent for a graded furrow system), or if it can be leveled at a reasonable cost, a surface irrigation system can be used. If, however, the land is rough, a sprinkler irrigation system would have to be used. Costs are shown for both a center pivot and a side roll system in Table 9. The center pivot system is self-propelled, is the most tolerant of rough or sloping conditions, and requires the least labor. Side roll systems require 3.3 times more labor than a center pivot system but require less water pressure and hence less fuel. Total capital costs are \$41,898 per center pivot assembly (two assemblies irrigate 260 acres) versus \$37,390 per side roll assemblies (which could irrigate 304 acres). Costs are also developed for surface irrigation. Labor is the major cost item that significantly increases with a surface system. Land development costs are also assumed to increase to \$200 per acre.

Variables that influence well costs are depth, lift, and yield of the well, and the source of power. Well costs are based on the assumptions of 500 feet depth, 350 feet lift, and 1,500 gpm yield. Average pumping depths in Nevada for existing irrigation wells are: 335 feet in Washoe, Churchill, Mineral, Douglas, Lyon and Storey Counties; 231 feet in Clark and Lincoln Counties; and 214 feet in the remaining counties (4, p. 12).

The assumption of a 1,500 gpm yield was developed from a study of average yields of several valleys in Nevada. Two 1,500 gpm wells would be required to irrigate 320 acres of alfalfa (assumption: four acre feet of water, 100-day growing season, and 24 hour/day operation). Total costs for two 1,500 gpm wells under the above assumptions would be \$173,862. If a well could be developed with a 3,000 gpm yield, these costs would be reduced to \$107,958. The likelihood of developing a 3,000 gpm well would be small. Both well costs are carried forward in the analysis to show the effects of the alternative assumptions on net income.

A diesel power unit was chosen for the analysis. Excluding power transmission line costs, at current fuel rates, electrical power units are considerably cheaper (47 percent of capital costs and 80 percent of fuel costs) than comparable diesel power units. Power transmission line costs are approximately three to five dollars/ft. (\$15,840 to \$26,400/mile), and if the producer pays the entire cost at any distance over six to ten miles a diesel unit becomes cost effective. (Some electrical power companies have a rebate program available on power transmission line costs which would make electrical power more reasonable.) Diesel fuel costs were calculated at \$.48/gallon.

Variables that influence fuel requirements are the pressure needed for the irrigation system, the pumping depth, the pumping unit's efficiency, and the amount of water required. Fuel requirements were estimated for 1,500 gpm and 3,000 gpm, respectively, at 9 and 11 gallons per hour for a surface system; 11 and 13 gallons per hour for a side roll sprinkler system; and 13 and 15 gallons per hour for a center pivot irrigation system. Engine maintenance was figured as a percentage of fuel costs while repairs were figured as a percentage of investment costs (Table 9). Alfalfa requires the most water of the crops analyzed (48" of water per acre). Different fuel costs for the other crops were based on irrigation requirements of 36" of water per acre for alfalfa seed, 25" for potatoes, and 38" for small grains. Well size was held constant throughout the analysis because of the requirement to rotate crops to protect the soil productivity and to prevent declining yields.

An interest rate of 10 percent was used to amortize the capital costs associated with land development and irrigation systems over the life of the project. Today's farmer is faced with a tight money market and high interest rates. The 10 percent rate is below the going commercial rate. Interest rates at institutions specializing in farm credit as of March 1979, range from 8.5 percent (Farmers Home Administration) to 10.5 percent (Federal Land Bank). A short term interest rate of 12.5 percent was used to figure interest on operating capital.

Labor and Machinery Costs

Labor was divided into operator labor and hired labor in order to show net income that would accrue to the operator. The breakdown was done by assuming that the maximum operator labor (including unpaid family members) is 260 hours per month and that any labor above 260 hours would be hired. This assumes that the DLE applicant is not expanding an existing operation. For an existing operation, a portion of the operator's labor charge would have to be included in the hired labor cost.

The availability of custom services is assumed in the analysis. In some of the more remote locations, custom services may not be available. Lack of such service would significantly increase both labor and machinery costs.

No attempt was made to break machinery costs out of the analysis. Fixed machinery charges (excluding irrigation) are a relatively minor part of total costs. Fixed machinery costs would vary under different assumptions on total acreage but the variance has little impact on the cost picture.

Yields and Prices Received

An income figure based on a high, medium, and low yield was developed for all of the crops. Except for alfalfa hay, the income was based on the assumption that costs do not vary with the different yields. Although this is a gross approximation, it allows the reader to see how yield assumptions affect the income picture. Because of its greater importance in terms of acreage, alfalfa hay was analyzed in greater detail. The number of cuttings, the amount of irrigation, and custom work charges were all allowed to vary with the yield.

Current prices (1978) were initially used in all crop budgets. Prices received for crops are one of the most variable factors affecting farmers. To show the effects of different price assumptions, income estimates were developed using current prices and normalized prices (1976-1978 average). Table 10 shows the prices used in the analysis.

CROP BUDGET ANALYSIS

Crop budgets developed for alfalfa hay, alfalfa seed, wheat, and potatoes under three alternative irrigation assumptions (center pivot, side roll, and surface, using two 1,500 gpm wells) are included in Appendix A. The results of these budgets and budgets developed with a 3,000 gpm well assumption are summarized for 1976-1978 average prices in Tables 11 through 15. Tables summarizing current prices are included in Appendix B. Illustrations 3 through 6 show the results for average prices graphically. The results are discussed by crop below. Because of the requirements to rotate the crops, the results of the individual crop budgets must be weighed by their relative length of time in a rotation system. This is done in the final section.

Alfalfa Hay

Alfalfa hay is produced in every county in the State. Prices received for alfalfa hay were low during 1978 and have only recently climbed back to \$60/ton. Alfalfa hay yields are lower in Nevada than in some of the surrounding states due to the short growing seasons. Given the high costs of developing a deep-well irrigation system, low yields, and low cash value, income from alfalfa hay production was negative under all irrigation assumptions at current prices and at normalized prices except the high yield, low irrigation cost assumption. This is a very restrictive assumption requiring a long growing season and easily developed land.

For the two well, center pivot combination, costs per ton at a yield of four tons/acre are \$94/ton (\$85 and \$72 for the two well side roll and surface system, respectively). These prices represent the minimum price that alfalfa would have to reach before it would begin to become profitable to raise alfalfa. As the yield per acre declines, the costs per ton become higher making the economics even worse (Tables 11, 12).

Net income for the various yields is shown in Illustration 3. County averages can be used as a measure of a farmer's expected yield. An alternative to using county averages is the use of the following equations which were developed to predict yield (Y) based on growing season (N - number of days between 28°) (26, p. 34):

$$Y = .007 N + 1.73 \quad (\text{Humboldt, Lander, Elko, White Pine, and Eureka})$$

$$Y = .007 N + 2.41 \quad (\text{remaining counties})$$

$$Y = \text{Yield (tons)}$$

$$N = \text{Number of days between } 28^{\circ}$$

An example to show how this equation works is Ruby Valley with an 85 day growing season. Predicted yield is 2.3 tons which generates a loss of between \$120 and \$210 per acre (Illustration 3). The breakeven yield occurs at 5.4 tons with surface irrigation and over six tons for the center pivot and side roll systems.

Fixed machinery costs (excluding irrigation costs) are a minor component (\$15/acre) of total costs of raising alfalfa hay. Even if an existing farmer is expanding his operation and he owns all his own equipment, he would not be able to profitably develop a deep-well irrigation system to raise alfalfa.

Small Grains

Prices received for wheat and barley in 1978 are lower than the prices received in 1974. Both barley and wheat are important in crop rotation systems in the State.

The budgets developed in the appendix and summarized in Table 13 are based on spring wheat. Winter wheat is closely comparable with spring wheat and the same numbers can be used. To adjust the budgets for barley, a cost adjustment of \$2.05/acre and an income adjustment of \$49.43/acre for a net return adjustment of \$51.93/acre should be made.

Income is negative under all price, yield, and irrigation assumptions.

Potatoes

Potatoes are a relatively new crop to Nevada with significant acreage being planted in potatoes since 1974. Prices for potatoes averaged \$3.00/cwt in 1978 but currently have dropped to \$2.50/cwt.

Potatoes are the highest risk crop of those analyzed. Annual costs are \$312,738 versus \$111,439 for alfalfa hay (2, 1,500 gpm - side roll irrigation). Hence, the potential losses are up to three times greater for potatoes than for other crops.

Returns are negative for average prices and medium yield assumptions for all irrigation systems. This situation becomes worse if one considers current (1979) prices. Returns are positive under all high yield assumptions.

Alfalfa Seed

Alfalfa seed is the only crop raised in Nevada that is nationally significant with Nevada ranked fourth in the nation for alfalfa seed production. Alfalfa seed production is concentrated in Humboldt, Pershing, and Lander Counties and requires fairly restrictive growing conditions, i.e., suitable soils and climate and relative isolation from other crops.

Alfalfa seed is the only crop analyzed that has shown a steady increase in price.

Under high yield assumptions, income is positive under all irrigation systems for both average and current prices. Income is also positive under medium yields and current prices for favorable irrigation assumptions. Current prices are at an all-time high. Under 1976-1978 average prices income is negative under medium yield assumptions.

Rotation Systems

Three rotation systems are shown in Table 16: alfalfa seed-small grains, potatoes-small grains, and alfalfa hay-small grains. Rotation systems are necessary in farming to prevent declining yields through loss of soil productivity. Income is negative under these systems except under the assumptions of average prices and high yields for the potato-small grains and alfalfa seed-small grains. These assumptions are very restrictive and not likely to occur in most instances.

Summary and Conclusions

Less acreage has been transferred to citizens in Nevada under agricultural entry acts (Homestead, Carey, and Desert Land Entry Acts) than in any other western state. Reasons for the lack of success of the agricultural entry acts include: limited rainfall which results in little water available for agriculture; lack of surface water which can be used for irrigation; rugged topography; a harsh climate and limited growing season in much of the State; alkali soils; and distance from major markets. All of these factors combine to make farming marginal in Nevada.

The economic situation facing the Desert Land Entry applicant today is as bad or worse than that faced historically. A deep well irrigation system would probably have to be developed in order to open new land. Nevada's valleys are alluvium deposits and well yields will generally support only limited acreage precluding any economics-of-scale. Well development and pumping unit costs will run \$173,862 to irrigate 320 acres, with annual fuel costs from \$18,000 to \$20,000. Irrigation system costs and land development costs will have to be added onto those costs, resulting in total development costs ranging from \$200,000 to \$280,000.

The price received for crops has not kept up with the increase in production costs. Prices for alfalfa hay, wheat, and barley have declined since 1974. Prices received for potatoes in 1978 were 18 percent above the 1974 level; however, current 1979 prices are equal to the 1974 level. Only alfalfa seed has shown a steady increase at 39 percent above the 1974 level. Excluding other forms of hay, these crops represent 97 percent of the acreage and the majority of the value of crops in Nevada. Production costs, on the other hand, increased a total of 32 percent between 1974 and 1978.

Crop budgets were developed for alfalfa hay, alfalfa seed, wheat, and potatoes. Budgets are based on current costs of existing farmers and estimates of the costs of developing deep well irrigation systems. For low value crops (alfalfa hay and wheat) a negative return was obtained under all irrigation and yield assumptions at current prices. Income from wheat was also negative under all irrigation assumptions and at 1976-1978 average prices. With average prices, income from alfalfa hay was positive only under high yields and low irrigation costs, an assumption that requires a relatively long growing season and easily developed agricultural land.

The economic situation is slightly improved if high value crops (alfalfa seed and potatoes) are considered. Income is positive under all high yield assumptions and under medium yield and favorable irrigation assumptions for both current and average prices. These crops are high risk crops with annual costs for potatoes at \$313,000 compared with an annual cost of \$111,000 for alfalfa under the same irrigation assumptions. Assuming medium yields, a \$.50/cwt change in price of potatoes can convert a \$52,000 net income into a -\$214 net loss. Potatoes and alfalfa seed

also have a much more restrictive set of conditions under which they can be grown. They are not adaptable to most Nevada counties.

When potatoes and alfalfa seed are included in crop rotation systems, income is positive only under high yields and low irrigation cost assumptions. These assumptions are extremely restrictive, making the economics negative in most instances.

TABLE 1

Trends in Nevada Agriculture, 1940-1974

Year	Number of Farms	Land in Farms (acres)	Average Size (acres)	Harvested Cropland (acres)	Irrigated Land (acres)
1940	3,573	3,785,106	1,059	435,855	755,636
1945	3,429	6,178,004	1,802	486,842	674,204
1950	3,110	7,063,525	2,274	421,202	727,498
1954	2,857	8,231,270	2,881	360,011	567,498
1959	2,354	10,942,936	4,649	337,529	542,976
1964	2,156	10,482,500	4,862	507,215	824,515
1969	2,112	10,708,346	5,070	521,024	752,696
1974	2,076	10,813,610	5,209	551,300	777,510

Source: U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, Nevada State and County Data, Vol. 1. Part 28, 1977, p. 1-1.

TABLE 2
Major Crops Harvested in Nevada, 1977

	Acres Harvested		Production			Value of Production ^{a/}		
	Acres (000's)	Per- cent	Per Acre	Total (000's)	Unit	Per Unit	Dollars (000's)	Per- cent
Winter Wheat	16.0	3	60.0	960	Bu.	2.65	2,544	3
Spring Wheat	12.0	2	50.0	600	Bu.	2.60	1,560	2
Oats	4.0	1	55.0	220	Bu.	1.30	286	*b/
Barley	19.0	4	65.0	1235	Bu.	1.95	2,408	3
Alfalfa Seed	15.5	3	520.0	8060	Lb.	1.25	10,075	12
Cotton, lint	1.3	*	628.0	1.7	Bale	.57	465	1
Cottonseed	-	-	-	.8	Ton	78.00	62	*
Potatoes	14.0	3	340.0	4760	Cwt.	2.90	13,804	17
Corn for Silage	3.0	1	15.0	45	Ton	21.00	945	1
All Hay	420.0	83	2.1	879	Ton	55.00	48,785	60
Alfalfa Hay	180.0	36	3.4	603	Ton	NA	NA	
All other Hay	240.0	48	1.2	276	Ton	NA	NA	
TOTAL	504.8	100.0					80,934	100

^{a/} Excludes all Government support payments.

^{b/} * - Less than 1 percent.

Source: Nevada Crop and Livestock Reporting Service, Nevada Agricultural Statistics, 1977.

TABLE 3

Nevada Farm Proprietors' Income; Totaled by County, 1971-1976
(thousands of dollars)

Farm Proprietors' Income						
County	1971	1972	1973	1974	1975	1976
Churchill	4,710	6,333	9,521	8,656	6,306	8,521
Clark	192	170	158	1,097	1,250	1,487
Douglas	1,409	2,052	2,437	1,828	1,902	1,363
Elko	5,361	7,573	8,617	2,001	222	-1,647
Esmeralda	382	434	496	322	366	149
Eureka	375	30	-1	-1,087	-1,739	-1,866
Humboldt	1,395	1,545	3,652	1,459	3,340	2,219
Lander	43	286	542	-681	-1,242	-1,406
Lincoln	-85	48	252	-474	-664	-931
Lyon	2,568	3,599	5,839	4,285	4,746	4,180
Mineral	46	127	273	199	187	140
Nye	45	295	1,019	-179	-412	-691
Pershing	3,680	3,957	5,765	3,987	3,934	4,241
Storey	NA	NA	NA	NA	NA	NA
Washoe	1,234	1,613	2,205	1,388	1,426	1,132
White Pine	1,006	1,646	1,848	248	332	-193
Carson City	264	120	403	20	17	0
NEVADA	22,625	29,827	43,026	23,069	19,971	16,698

N/A - Not Available

Source: U.S. Department of Commerce, Bureau of Economic Analysis,
Regional Economics Information System, July 1978.

TABLE 4

Average Farm Proprietors' Income; 1971-1976
(dollars)

Average Income ^{2/}

County	No. of Farms	1971	1972	1973	1974	1975	1976
Churchill	430	10,953	14,728	22,142	20,130	14,665	19,816
Clark	147	1,306	1,156	1,075	7,453	8,503	10,116
Douglas	107	13,168	19,178	22,776	17,084	17,775	12,738
Elko	244	21,971	31,037	35,316	8,201	910	-6,750
Esmeralda	26	14,692	16,692	19,077	12,385	14,077	5,731
Eureka	62	6,049	484	-16	-17,532	-28,048	-30,097
Humboldt	141	9,894	10,957	25,901	10,348	23,688	15,738
Lander	58	741	4,931	9,345	-11,741	-21,414	-24,241
Lincoln	75	-1,133	640	3,360	-6,320	-8,853	-12,413
Lyon	268	9,582	13,429	21,787	15,989	17,709	15,619
Mineral	28	1,643	4,536	9,750	7,107	6,679	5,000
Nye	97	464	3,041	10,505	-1,845	-4,247	-7,124
Pershing	97	37,938	40,794	59,433	41,103	40,557	43,722
Storey	5	NA	NA	NA	NA	NA	NA
Washoe	176	7,011	9,165	12,528	7,886	8,102	6,432
White Pine	100	10,060	16,460	18,480	2,480	3,320	-1,930
Carson City	15	17,600	8,000	26,867	1,333	1,133	0
NEVADA	2,076	10,900	14,370	20,730	11,110	9,620	8,050

N/A - Not Available.

Source: ¹ U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, Nevada State and County Data, Vol. 1, Part 28, 1977, p II-1

² Obtained by dividing farm proprietors income (Table 3) by number of farms.

TABLE 5
A Comparison of Agriculture in Nevada and Surrounding States

	Nevada	Arizona	California	Oregon	Idaho	Utah
Number of Farms - 1974 ¹	2,076	5,803	67,674	26,753	23,680	12,184
Total Acres in Farms - 1974 ¹	10,813,610	37,944,191	33,385,619	18,241,445	14,274,258	10,610,050
Average Acres per Farm 1974 ¹	5,209	6,539	493	682	603	871
Total Cash Receipts 1974 (thousands of dollars) ²	136,488	1,201,547	8,669,190	1,107,165	1,464,756	323,510
Number of Farms - 1977 ²	2,100	6,600	75,000	34,000	27,000	13,400
(% Change in number of farms 1974-1977)	0%	14%	11%	27%	14%	10%
Total Cash Receipts 1977 (thousands of dollars) ²	149,714	1,203,112	9,445,040	1,057,737	1,212,699	382,027
(% Change in Cash Receipts 1974-1977)	10%	0%	9%	-4%	-17%	18%
Realized Net Income per Farm (dollars) ³						
1950	7,039	11,232	5,609	2,426	2,718	2,312
1960	3,503	14,379	8,650	2,325	4,353	1,932
1964	-1,357	10,403	11,378	1,355	4,249	1,032
1969	6,615	21,948	15,995	3,542	7,599	3,278
1973	24,074	34,696	32,393	11,045	15,819	9,181

- Sources: 1 U.S. Department of Commerce, Bureau of the Census. 1974 Census of Agriculture, State Summary (various states) Washington, D.C.: U.S. Government Printing Office, 1977.
- 2 U.S. Department of Agriculture. Agricultural Statistics (various years) Washington, D.C.: U.S. Government Printing Office.
- 3 U.S. Department of Agriculture. Economic Research Service Farm Income Estimates 1949-1973, FIS-224 Supplement, 1974.

TABLE 6

Acreage Transferred Under The Desert Land Entry And Homestead Acts

	<u>Nevada</u>	<u>Arizona</u>	<u>California</u>	<u>Oregon</u>	<u>Idaho</u>	<u>Utah</u>
Desert Land Entries 1877-1976						
Number	1,687	2,343	6,318	2,389	7,617	3,308
Acres	376,338	507,392	1,210,257	368,007	1,503,817	514,764
Homestead Entries 1868-1976						
Number	4,370	20,268	66,738	62,926	60,221	16,798
Acres	704,167	4,134,356	10,476,665	10,513,945	9,733,455	3,607,683
Stock Raising Homestead 1917-1976						
Number	930	6,226	8,464	8,282	7,818	5,150
Acres	<u>494,637</u>	<u>2,985,746</u>	<u>3,423,222</u>	<u>3,375,688</u>	<u>3,563,294</u>	<u>2,800,709</u>
Total Acreage	1,575,142	7,627,494	15,110,144	14,257,640	14,800,566	6,923,156

Source: U.S. Bureau of Land Management, Public Land Statistics 1976,
Washington, D.C.; U.S. Government Printing Office, 1977.

TABLE 7
Desert Land Entry Applications, Allowed and Patented
From July 1, 1951 to July 1, 1976 (Fiscal Years)

Fiscal Year	Number of Applications	Allowed		Patented	
		No.	Acres	No.	Acres
(1940-1944)		(4)	(520)	(6)	(797)
(1945-1949)		(9)	(1280)	(8)	(1172)
1950	115	(10)	(2161)	(1)	(320)
1951	24	(1)	(81)	0	0
1952	206	27	5763	1	160
1953	399	43	10087	2	200
1954	213	122	29095	0	0
1955	399	70	19828	1	157
1956	242	15	3718	2	240
1957	136	168	41094	5	1336
1958	846	18	3294	13	2802
1959	1613	50	11593	14	3165
1960	895	98	26509	21	4572
1961	413*	220	61453	32	7906
1962	0*	34	9113	65	15248
1963	863*	162	47315	79	20127
1964	788	33	8968	89	24650
1965		116	35122	121	34568
1966		62	18856	58	15154
1967		26	8011	53	14457
1968		18	5369	45	12138
1969		4	1280	56	1602
1970		1	**	47	13428
1971				28	7954
1972				8	1923
1973		6	1920	10	3004
1974				5	1620
1975				1	320
1976				1	320
1977				1	320
Total Action on Filings 1950-1977	7152	1293	348388	758	187371

*Filings on DLE's closed from February 14, 1961 to September 4, 1962.

**Acreage previously recorded.

Note - Number in parentheses () indicates applications received before 1950. The numbers were included for comparison with Table 1.

Source: U.S. Bureau of Land Management, Public Land Statistics,
Washington, D.C., U.S. Government Printing Office 1940-1977.

TABLE 8

Estimated Costs of 1,500 GPM and 3,000 GPM Irrigation Well

Well Costs: Based on 500' gravel pack, 16" casing

Test well 8" 500' @ \$15.00/ft.	\$ 7,500
Electric log & hydro geology work	1,500
Pilot hole 12¼" hole @ \$15.00/ft.	7,500
Ream to 24" @ \$40.00/ft.	20,000
16" casing 500' @ \$12.00/ft.	6,000
Well screen @ \$42.00/ft. x 44 ft.	1,848
Select gravel for packing 26 c.y. @ \$10/c.y.	260
Grouting-7 c.y. grout @ \$40.00/c.y.	280
Well platform 5 c.y. concrete @ \$100/c.y.	500
Miscellaneous work by the hour	
Developing @ \$125.00/hr. x 20 hr.	2,500
Setting screen @ \$125.00/hr. x 10 hr.	<u>1,250</u>
	\$49,138

Costs of Engine, Column, and Pump

1,500 gpm with 350' lift	\$ 32,373	3,000 gpm with 350' lift	\$ 53,400
166 HP diesel engine, right		330 HP diesel engine, right	
Angle drive 12" bowls, 10" column,		Angle drive, 14" bowls, 12" column,	
13/16" shaft		15/16" shaft	
Transportation-engine column & pump	420	Transportation-engine, column, pump	420
Install @ \$125/hr. x 40 hrs.	<u>5,000</u>	Install @ \$125/hr. x 40 hrs.	<u>5,000</u>
SUBTOTAL (1,500 gpm well)	\$ 37,793	SUBTOTAL (3,000 gpm well)	\$ 58,820
(Total (1,500 gpm well)	\$ 86,931)	Total (3,000 gpm well)	\$107,958
Total - 2, 1,500 gpm wells	\$173,862		

Source: BLM Nevada State Office, February 1979.

TABLE 9
Irrigation and Land Development Costs
Center Pivot - 260 Irrigated Acres

Costs	Life	Total Cost	Annual Cost	Annual Cost/Acre
Land Development ¹				
Shaping & grading (\$100/acre)	30 yrs.	26000	2758	10.61
Fencing	30 yrs.	6300	668	2.57
Well Costs ¹				
Well (2 1,500 gpm)	25 yrs.	98276	10827	41.64
Engine, pump and gearhead (diesel)	8 yrs.	75586	14168	54.49
Irrigation System ²				
Center pivot assembly (2 @ \$41,898 ea.)	15 yrs.	<u>83796</u>	<u>11017</u>	<u>42.37</u>
Total Capital Costs		289958	39438	151.69
Operating Costs ²				
Power*				
(13 gal./hr. - 48"/acre)*			23494	90.36
Engine maintenance (5% of fuel)			1175	4.52
Pump & engine repairs			7142	27.47
Center pivot-assembly repairs (4% investment)			<u>3352</u>	<u>12.89</u>
Subtotal			35163	135.24
Labor			<u>702</u>	<u>2.70</u>
Total Operating Cost			35865	137.94
TOTAL COSTS			75303	289.63

*BLM estimate - 3000 gpm well @ 15 gallons/hour.

- Source: 1. BLM Nevada State Office, Feb. 1979.
 2. Fred Meyer, Gordon Myer, and Ronald Shane, Irrigation Costs of Side Roll, Center Pivot and Low Pressure Center Pivot for Diesel and Electric Power, Reno, Nevada: University of Nevada, Reno, Division of Agricultural and Resource Economics (in press).

TABLE 9 - Continued
Irrigation and Land Development Costs
Side Roll - 304 Acres

Costs	Life	Total Cost	Annual Cost	Annual Cost/Acre
Land development ¹				
Shaping & grading (\$100/acre)	30 yrs.	30400	3225	10.61
Fencing	30 yrs.	6300	668	2.20
Well Costs ¹				
Well (2, 1500 gpm)	25 yrs.	98276	10827	35.62
Engine, pump, and gearhead (diesel)	8 yrs.	75586	14168	46.61
Irrigation System ²				
Side roll assembly (2 @ \$37,390 each)	12 yrs.	<u>74780</u>	<u>10975</u>	<u>36.10</u>
Total Capital Costs		280942	39863	131.14
Operating Costs ²				
Power (11 gal./hr. - 48"/acre)*			23244	76.45
Engine maintenance (5% of fuel)			1161	3.82
Pump and engine repairs			7023	23.10
Side roll assembly repairs (5% of investment)			3739	12.30
Subtotal			35167	115.67
Labor (2 hrs. @ 4.50/hr.)			2736	9.00
Total Operating Cost			<u>37903</u>	<u>124.67</u>
TOTAL COSTS			79766	255.81

*BLM estimate - 3000 gpm well @ 13 gallons/hour.

- Source: 1. BLM Nevada State Office, Feb. 1979.
 2. Fred Meyer, Gordon Myer, and Ronald Shane, Irrigation Costs of Side Roll, Center Pivot and Low Pressure Center Pivot for Diesel and Electric Power, Reno, Nevada: University of Nevada, Reno, Division of Agricultural and Resource Economics (in press).

TABLE 10
Prices Received for Crops in Nevada, 1974-1978

Crop	1978	1977	1976	1975	1974	Average 1976-1978
Alfalfa Hay *(\$/ton)	57	67	71	59	64	65
Alfalfa Seed (\$/lb.)	135	125	110	77	97	123
Wheat (\$/bu.)	3.34	2.62	2.87	3.06	3.67	2.94
Barley (\$/bu.)	2.02	1.95	2.45	2.55	2.90	2.14
Potatoes (\$/cwt)	3.00	2.90	2.35	3.15	2.55	2.75

*Based on a simple 12 month average.

Source: Nevada Crop and Livestock Reporting, Nevada Agricultural
Statistics, 1977; and "Crop Production, 1978 Annual Summary".

Table 11

COSTS AND RETURNS FOR ALFALFA - 3 CUTTINGS
USING THREE YEAR AVERAGE PRICES, 1976-1978

		YIELDS		
		HIGH	MEDIUM	LOW
ALFALFA - 3 CUTTINGS	YIELDS - TONS PER ACRE	5	4	3
CENTER PIVOT - 2, 1500 GPM WELLS				
TOTAL COSTS		411.56	407.66	403.76
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		-86.56	-147.66	-208.76
NET RETURN		-105.41	-166.51	-227.61
CENTER PIVOT - 3000 GPM WELL				
TOTAL COSTS		357.33	353.43	349.53
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		-32.33	-93.43	-154.53
NET RETURN		-51.18	-112.28	-173.38
SIDE ROLL - 2, 1500 GPM WELLS				
TOTAL COSTS		370.47	366.57	362.67
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		-45.47	-106.57	-167.67
NET RETURN		-70.62	-131.72	-192.82
SIDE ROLL - 3000 GPM WELL				
TOTAL COSTS		323.91	320.01	316.11
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		1.09	-60.01	-121.11
NET RETURN		-24.06	-85.16	-146.26
SURFACE - 2, 1500 GPM WELLS				
TOTAL COSTS		313.34	309.44	305.54
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		11.66	-49.44	-110.54
NET RETURN		-16.86	-77.96	-139.06
SURFACE - 3000 GPM WELL				
TOTAL COSTS		259.35	255.45	251.55
INCOME		325.00	260.00	195.00
RETURN (WITH LABOR)		65.65	4.55	-56.55
NET RETURN		37.13	-23.97	-85.07

Table 12

COSTS AND RETURNS FOR ALFALFA - 2 CUTTINGS
USING THREE YEAR AVERAGE PRICES, 1976-1978

		YIELDS		
		HIGH	MEDIUM	LOW
ALFALFA - 2 CUTTINGS				
YIELDS -	TONS PER ACRE	3	2	1
CENTER PIVOT - 2, 1500 GPM WELLS				
TOTAL COSTS		358.10	354.20	350.30
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-163.10	-224.20	-285.30
NET RETURN		-178.17	-239.27	-300.37
CENTER PIVOT - 3000 GPM WELL				
TOTAL COSTS		314.40	310.50	306.60
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-119.40	-180.50	-241.60
NET RETURN		-134.47	-195.57	-256.67
SIDE ROLL - 2, 1500 GPM WELLS				
TOTAL COSTS		320.84	316.94	313.04
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-125.84	-186.94	-248.04
NET RETURN		-147.21	-208.31	-269.41
SIDE ROLL - 3000 GPM WELL				
TOTAL COSTS		282.90	279.00	275.10
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-87.90	-149.00	-210.10
NET RETURN		-109.27	-170.37	-231.47
SURFACE - 2, 1500 GPM WELLS				
TOTAL COSTS		267.54	263.64	259.74
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-72.54	-133.64	-194.74
NET RETURN		-93.19	-154.29	-215.39
SURFACE - 3000 GPM WELL				
TOTAL COSTS		220.26	216.36	212.46
INCOME		195.00	130.00	65.00
RETURN (WITH LABOR)		-25.26	-86.36	-147.46
NET RETURN		-45.91	-107.01	-168.11

Table 13

COSTS AND RETURNS FOR SPRING WHEAT
USING THREE YEAR AVERAGE PRICES, 1976-1978

	YIELDS		
	HIGH	MEDIUM	LOW
SPRING WHEAT			
YIELDS - BU. PER ACRE	80	60	40
CENTER PIVOT - 2, 1500 GPM WELLS			
TOTAL COST	398.11	398.11	398.11
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-162.91	-221.71	-280.51
NET RETURN	-180.91	-239.71	-298.51
CENTER PIVOT - 3000 GPM WELL			
TOTAL COST	350.59	350.59	350.59
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-115.39	-174.19	-232.99
NET RETURN	-133.39	-192.19	-250.99
SIDE ROLL - 2, 1500 GPM WELLS			
TOTAL COST	359.14	359.14	359.14
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-123.94	-182.74	-241.54
NET RETURN	-148.23	-207.03	-265.83
SIDE ROLL - 3000 GPM WELL			
TOTAL COST	318.05	318.05	318.05
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-82.85	-141.65	-200.45
NET RETURN	-107.14	-165.94	-224.74
SURFACE - 2, 1500 GPM WELLS			
TOTAL COST	303.59	303.59	303.59
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-68.39	-127.19	-185.99
NET RETURN	-95.56	-154.36	-213.16
SURFACE - 3000 GPM WELL			
TOTAL COST	253.87	253.87	253.87
INCOME	235.20	176.40	117.60
RETURN (WITH LABOR)	-18.67	-77.47	-136.27
NET RETURN	-45.84	-104.64	-163.44

Table 14
COSTS AND RETURNS FOR POTATOES
USING THREE YEAR AVERAGE PRICES, 1976-1978

		YIELDS		
		HIGH	MEDIUM	LOW
POTATOES				
YIELDS -	CWT. PER ACRE	400	325	275
CENTER PIVOT - 2, 1500 GPM WELLS				
TOTAL COST		1063.31	1063.31	1063.31
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		36.69	-169.56	-307.06
NET RETURN		19.41	-186.84	-324.34
CENTER PIVOT - 3000 GPM WELL				
TOTAL COST		1027.90	1027.90	1027.90
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		72.10	-134.15	-271.65
NET RETURN		54.82	-151.43	-288.93
SIDE ROLL - 2, 1500 GPM WELLS				
TOTAL COST		1028.74	1028.74	1028.74
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		71.26	-134.99	-272.49
NET RETURN		47.68	-158.57	-296.07
SIDE ROLL - 3000 GPM WELL				
TOTAL COST		997.57	997.57	997.57
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		102.43	-103.82	-241.32
NET RETURN		78.85	-127.40	-264.90
SURFACE - 2, 1500 GPM WELLS				
TOTAL COST		977.60	977.60	977.60
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		122.40	-83.85	-221.35
NET RETURN		94.32	-111.93	-249.43
SURFACE - 3000 GPM WELL				
TOTAL COST		935.60	935.60	935.60
INCOME		1100.00	893.75	756.25
RETURN (WITH LABOR)		164.40	-41.85	-179.35
NET RETURN		136.32	-69.93	-207.43

Table 15

COSTS AND RETURNS FOR ALFALFA SEED

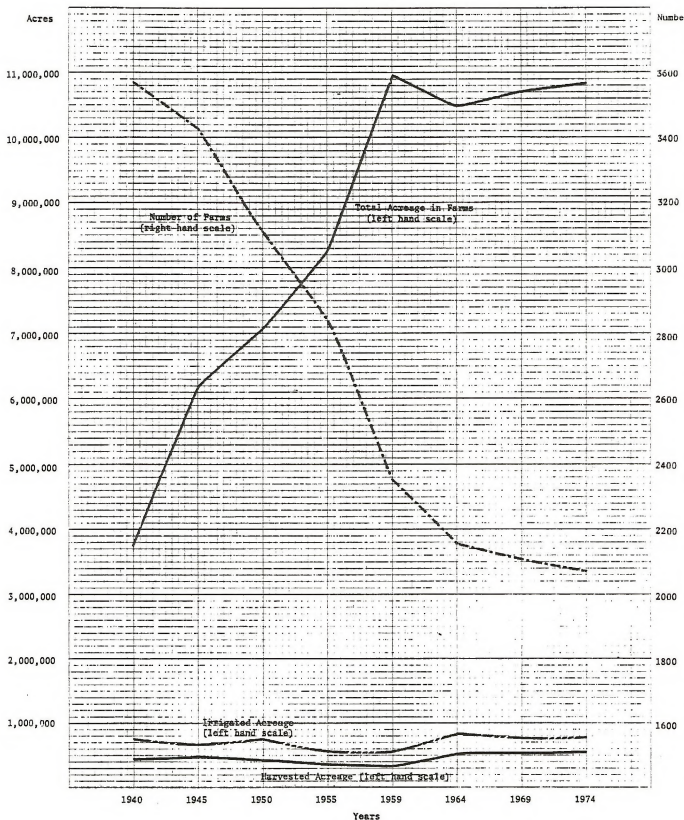
USING THREE YEAR AVERAGE PRICES, 1976-1978

	YIELDS		
	HIGH	MEDIUM	LOW
ALFALFA SEED			
YIELDS - CWT. PER ACRE	5	4	3
CENTER PIVOT - 2, 1500 GPM WELLS			
TOTAL COST	597.64	597.64	597.64
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	17.36	-105.64	-228.64
NET RETURN	11.83	-111.17	-234.17
CENTER PIVOT - 3000 GPM WELL			
TOTAL COST	551.98	551.98	551.98
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	63.02	-59.98	-182.98
NET RETURN	57.49	-65.51	-188.51
SIDE ROLL - 2, 1500 GPM WELLS			
TOTAL COST	559.35	559.35	559.35
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	55.65	-67.35	-190.35
NET RETURN	43.82	-79.18	-202.18
SIDE ROLL - 3000 GPM WELL			
TOTAL COST	519.78	519.78	519.78
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	95.22	-27.78	-150.78
NET RETURN	83.39	-39.61	-162.61
SURFACE - 2, 1500 GPM WELLS			
TOTAL COST	504.47	504.47	504.47
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	110.53	-12.47	-135.47
NET RETURN	98.79	-24.21	-147.21
SURFACE - 3000 GPM WELL			
TOTAL COST	455.93	455.93	455.93
INCOME	615.00	492.00	369.00
RETURN (WITH LABOR)	159.07	36.07	-86.93
NET RETURN	147.33	24.33	-98.67

TABLE 16
Rotation Systems
Average Annual Net Returns
(Based on 1976-1978 Average Prices)

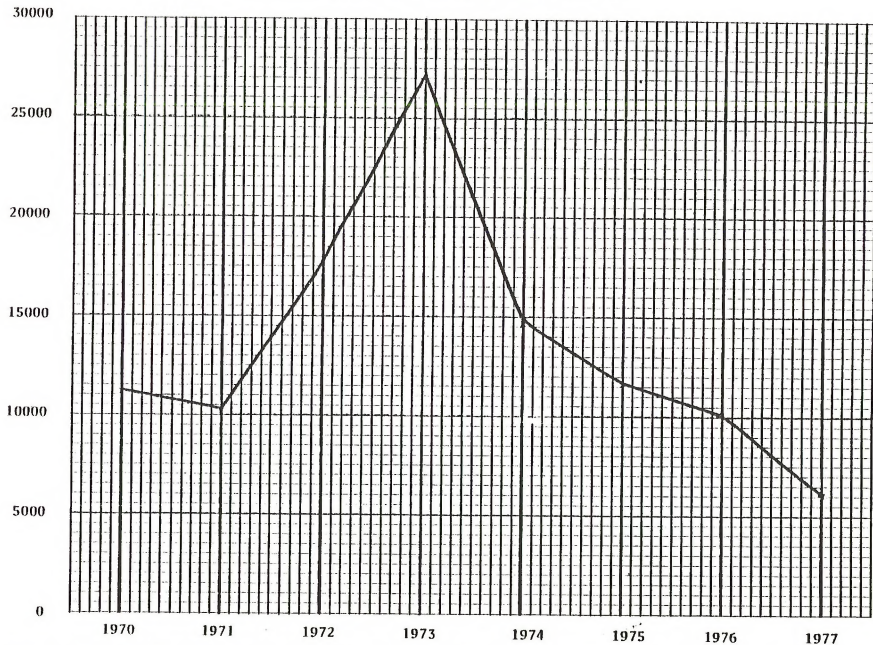
Irrigation System - Yield	3 Year Wheat 7 Year Alfalfa Seed	3 Year Wheat 7 Year Potatoes	3 Year Wheat 7 Year Alfalfa Hay
Two, 1,500 GPM Wells			
Center Pivot (260 acres)			
High Yield	-\$ 9,547	-\$ 6,029	-\$28,461
Medium Yield	-\$36,520	-\$48,153	-\$44,168
Low Yield	-\$63,492	-\$77,765	-\$59,874
Side Roll (304 acres)			
High Yield	\$ 539	\$ 3,860	-\$20,981
Medium Yield	-\$30,998	-\$45,392	-\$39,344
Low Yield	-\$62,535	-\$80,014	-\$57,708
Surface (315 acres)			
High Yield	\$17,909	\$20,526	-\$ 3,892
Medium Yield	-\$14,769	-\$30,508	-\$22,921
Low Yield	-\$47,447	-\$66,368	-\$41,950
3,000 GPM Well			
Center Pivot (260 acres)			
High Yield	\$ 2,469	\$ 4,122	-\$14,884
Medium Yield	-\$24,503	-\$38,002	-\$30,591
Low Yield	-\$51,476	-\$67,614	-\$46,298
Side Roll (304 acres)			
High Yield	\$12,707	\$14,241	-\$ 7,324
Medium Yield	-\$18,830	-\$35,011	-\$25,689
Low Yield	-\$50,367	-\$69,634	-\$44,053
Surface (315 acres)			
High Yield	\$33,311	\$34,486	\$12,712
Medium Yield	\$ 633	-\$16,549	-\$ 6,317
Low Yield	-\$32,046	-\$52,424	-\$25,347

Trends in Farming in Nevada
1940 - 1974



Source: U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, Nevada State and County Data, Vol. I, Part 28, 1977, p. I-1.

ILLUSTRATION 2
Variations in Average Net Farm Income, 1970-1977



Source: Nevada Crop and Livestock Reporting Service, Nevada Agricultural Statistics, 1977 (and various years

Net Income By Yield - Alfalfa

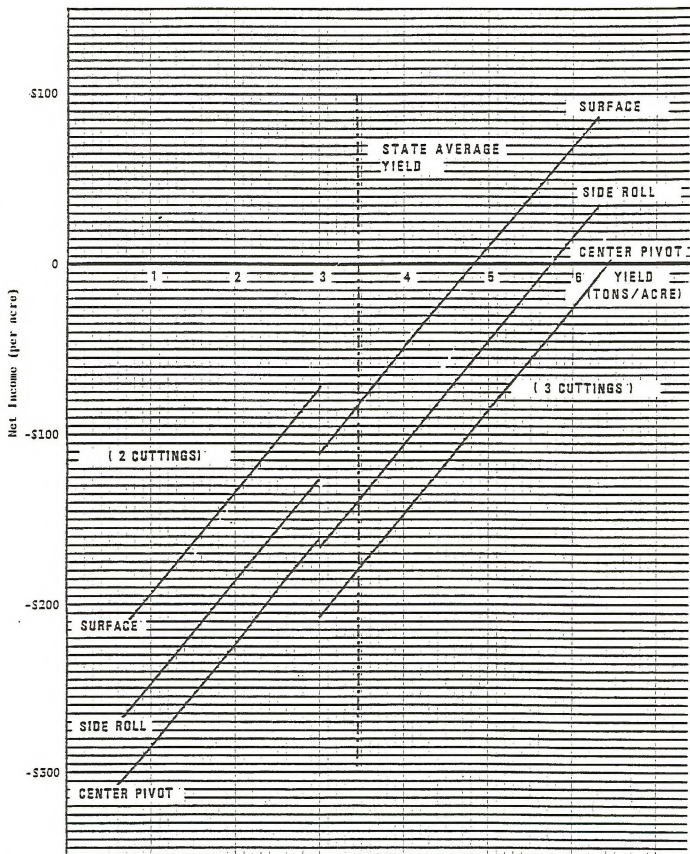


ILLUSTRATION 4

Net Income By Yield - Spring Wheat

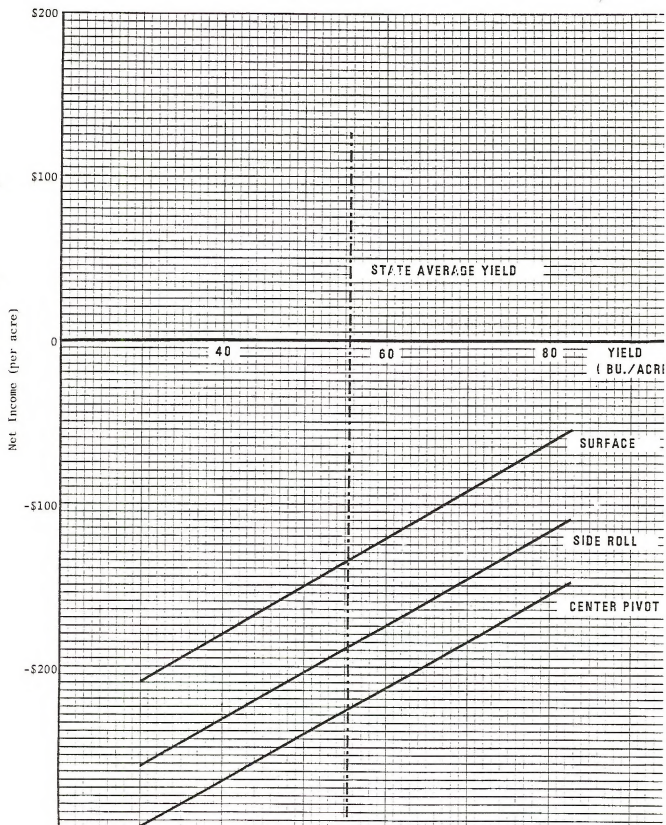


ILLUSTRATION 5

Net Income By Yield - Potatoes

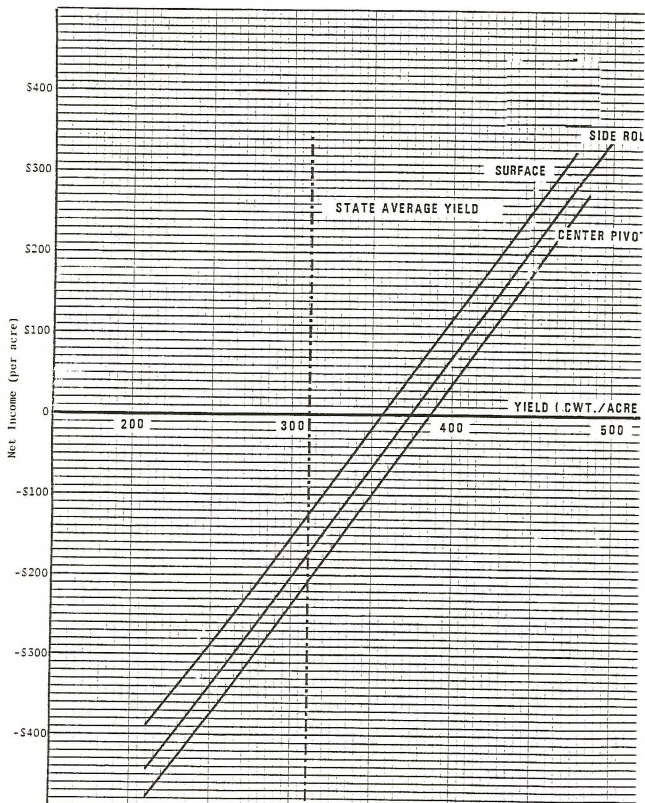
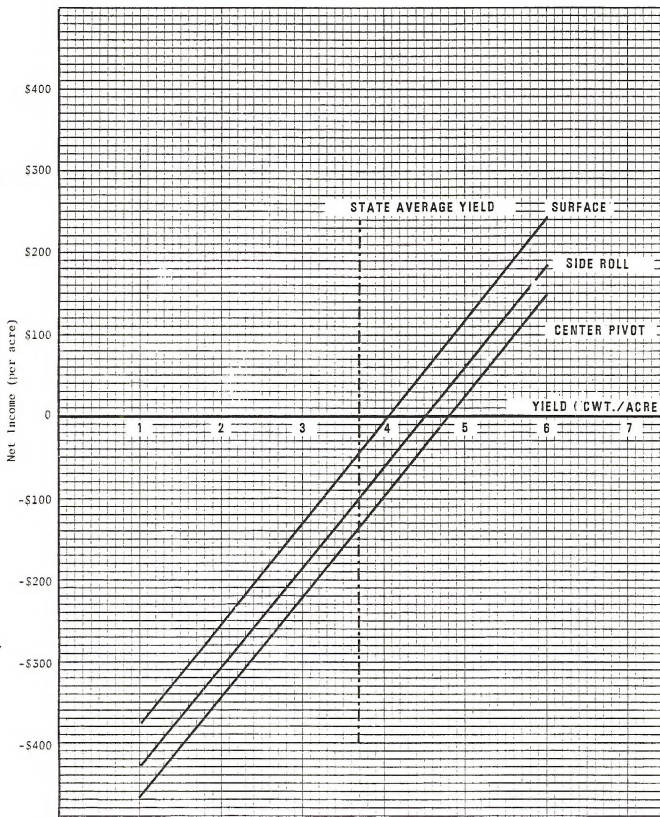


ILLUSTRATION 6

Net Income By Yield - Alfalfa Seed



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APPENDIX A

CROP BUDGETS

ALFALFA - 3 CUTTINGS
CENTER PIVOT - 260 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	3.27	850
WEED & INSECT CONTROL	16.87	4386
SWATH 3X	11.64	3026
BALE 3X	29.33	7626
HAUL & STACK 3X	15.68	4077
RAKE 3X	2.28	593
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	135.24	35163
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	10.71	2785
AMORTIZED ESTABLISHMENT COSTS	26.05	6773
TAXES ON LAND	4.90	1274
AMORTIZED LAND DEV. AND IRR. COSTS	151.69	39439
TOTAL COSTS	407.66	105992
INCOME:		
4 TONS AT \$60 PER TON	240.00	62400
RETURN TO LAND, LABOR, AND MANAGEMENT	-167.66	-43592
OPERATOR'S LABOR (4.19 HR. AT \$4.50 HR.)	18.85	4900
RETURN TO LAND AND MANAGEMENT	-186.51	-48493

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA - 3 CUTTINGS

SIDE ROLL - 324 ACRES

2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	3.27	994
WEED & INSECT CONTROL	16.87	5128
SWATH 3X	14.64	3539
BALF 3X	29.33	8916
HAUL & STACK 3X	15.68	4767
RAKE 3X	2.28	693
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	115.68	31168
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	9.73	2958
AMORTIZED ESTABLISHMENT COSTS	26.05	7919
TAXES ON LAND	4.90	1490
AMORTIZED LAND DEV. AND IRR. COSTS	131.14	39867
TOTAL COSTS	366.57	111439
INCOME		
4 TONS AT \$60 PER TON	240.00	72960
RETURN TO LAND, LABOR, AND MANAGEMENT	-126.57	-38479
OPERATOR'S LABOR (5.59 HR. AT \$4.50 HR.)	25.15	7645
RETURN TO LAND AND MANAGEMENT	-151.72	-46124

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA - 3 CUTTINGS

SURFACE - 315 ACRES

2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	3.27	1030
WEED & INSECT CONTROL	16.97	5314
SWATH 3X	11.64	3667
BALE 3X	29.33	9239
HAUL & STACK 3X	15.68	4939
RAKE 3X	2.28	719
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	88.36	27832
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	8.37	2537
AMORTIZED ESTABLISHMENT COSTS	26.06	8206
TAXES ON LAND	4.90	1543
AMORTIZED LAND DEV. AND IRR. COSTS	102.69	32367
TOTAL COSTS	309.44	97473
INCOME		
4 TONS AT \$50 PER TON	200.00	75600
RETURN TO LAND, LABOR, AND MANAGEMENT	-69.46	-21873
OPERATOR'S LABOR (6.34 HR. AT \$4.50 HR.)	28.52	8983
RETURN TO LAND AND MANAGEMENT	-97.96	-30856

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA - 2 CUTTINGS
CENTER PIVOT - 260 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	2.36	614
WEED & INSECT CONTROL	16.87	4386
SWATH 2X	7.76	2018
BALE 2X	16.95	4407
HAUL & STACK 2X	13.84	3598
RAKE 2X	1.52	395
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	111.52	28995
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	8.54	2220
AMORTIZED ESTABLISHMENT COSTS	26.05	6773
TAXES ON LAND	4.90	1274
AMORTIZED LAND DEV. AND IRR. COSTS	151.69	39439
TOTAL COSTS	362.00	94120
INCOME		
2 TONS AT \$60 PER TON	120.00	31200
RETURN TO LAND, LABOR, AND MANAGEMENT	-242.00	-62920
OPERATOR'S LABOR (3.35 HR. AT \$4.50 HR.)	15.07	3918
RETURN TO LAND AND MANAGEMENT	-257.07	-66838

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA - 2 CUTTINGS
SIDE ROLL - 304 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	2.36	717
WEED & INSECT CONTROL	16.87	5128
SMITH 2X	7.76	2359
BALE 2X	16.95	5153
HAUL & STACK 2X	13.84	4207
RAKE 2X	1.52	462
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	95.61	29066
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	7.74	2353
AMORTIZED ESTABLISHMENT COSTS	26.05	7919
TAXES ON LAND	4.90	1490
AMORTIZED LAND DEV. AND IRR. COSTS	131.14	39867
TOTAL COSTS	324.74	98722
INCOME		
2 TONS AT \$60 PER TON	120.00	36480
RETURN TO LAND, LABOR, AND MANAGEMENT	-204.74	-62242
OPERATOR'S LABOR (4.75 HR. AT \$4.50 HR.)	21.37	6496
RETURN TO LAND AND MANAGEMENT	-226.11	-68738

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA - 2 CUTTINGS

SURFACE - 315 ACRES

2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW	2.36	743
WEED & INSECT CONTROL	16.87	5314
SWATH 2X	7.76	2444
BALE 2X	16.95	5339
HAUL & STACK 2X	13.84	4360
RAKE 2X	1.52	479
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	71.94	22660
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	6.56	2066
AMORTIZED ESTABLISHMENT COSTS	26.05	8206
TAXES ON LAND	4.90	1543
AMORTIZED LAND DEV. AND IRR. COSTS	102.69	32347
TOTAL COSTS	271.44	85502
INCOME		
2 TONS AT \$60 PER TON	120.00	37800
RETURN TO LAND, LABOR, AND MANAGEMENT	-151.44	-47702
OPERATOR'S LABOR (4.59 HR. AT \$4.50 HR.)	20.65	6504
RETURN TO LAND AND MANAGEMENT	-172.09	-54207

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

POTATOES
CENTER PIVOT - 260 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
DISC	5.36	1394
PLOW	9.34	2428
SMOOTHING	3.30	858
PLANTING	207.17	53864
HARROW	2.68	697
HILL UP & FURROW	2.69	699
INSECT CONTROL	107.00	27820
WEED CONTROL	11.00	2860
DISEASE CONTROL	13.00	3380
FERTILIZER	107.50	27950
SPROUT INHIBITOR	15.00	3900
DEFOLIATE	10.50	2730
ROLLER	2.96	770
HARVEST	34.07	8858
HAUL	40.00	10400
STORE	118.16	30722
HIRED LABOR	31.14	8096
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	89.78	23342
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	40.53	10538
INTEREST ON OPERATING CAPITAL (12.5%)	53.73	13971
TAXES ON LAND	6.71	1745
AMORTIZED LAND DEV. AND IRR. COSTS	151.69	39439
TOTAL COSTS	1063.31	276461
INCOME		
320 CWT. AT \$3.00/CWT.	960.00	249600
RETURN TO LAND, LABOR, AND MANAGEMENT	-103.31	-26861
OPERATOR'S LABOR (3.94 HR. AT \$4.50 HR.)	17.28	4492
RETURN TO LAND AND MANAGEMENT	-120.59	-31354

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

POTATOES

SIDE ROLL - 304 ACRES

2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
DISC	5.36	1629
PLOW	9.34	2939
SMOOTHING	3.30	1003
PLANTING	207.17	62980
HARROW	2.68	815
HILL UP & FURROW	2.69	818
INSECT CONTROL	107.00	32528
WEED CONTROL	11.00	3344
DISEASE CONTROL	13.00	3952
FERTILIZER	107.50	32680
SPROUT INHIBITOR	15.00	4560
DEFOLIATE	10.50	3192
ROLLER	2.96	900
HARVEST	34.07	10357
HAUL	40.00	12160
STORE	118.16	35921
HIRED LABOR	31.14	9467
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	77.21	23473
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	39.90	12130
INTEREST ON OPERATING CAPITAL (12.5%)	52.91	16084
TAXES ON LAND	6.71	2040
AMORTIZED LAND DEV. AND IRR. COSTS	131.14	39967
TOTAL COSTS	1028.74	312738
INCOME		
320 CWT. AT \$3.00/CWT.	960.00	291340
RETURN TO LAND, LABOR, AND MANAGEMENT	-68.74	-20898
OPERATOR'S LABOR (5.24 HR. AT \$4.50 HR.)	23.58	7168
RETURN TO LAND AND MANAGEMENT	-92.32	-28066

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

POTATOES
SURFACE - 315 ACRES
2, 1500 GPM WELLS

COSTS	PER ACRE VALUE	TOTAL VALUE
DISC	5.36	1 688
PLOW	9.34	2942
SMOOTHING	3.30	1040
PLANTING	207.17	65259
HARROW	2.68	844
HILL UP & FURROW	2.69	947
INSECT CONTROL	107.00	33705
WEED CONTROL	11.00	3465
DISEASE CONTROL	13.00	4095
FERTILIZER	107.50	33863
SPROUT INHIBITOR	15.00	4725
DEFOLIATE	10.50	3308
ROLLER	2.96	932
HARVEST	34.07	10732
HAUL	40.00	12600
STORE	118.10	37220
HIRED LABOR	31.14	9509
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	56.88	17918
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	38.88	12247
INTEREST ON OPERATING CAPITAL (12.5%)	51.57	16245
TAXES ON LAND	6.71	2114
AMORTIZED LAND DEV. AND IRR. COSTS	102.69	32347
TOTAL COSTS	977.60	307945
INCOME		
320 CWT. AT \$3.00/CWT.	960.00	302400
RETURN TO LAND, LABOR, AND MANAGEMENT	-17.60	-5545
OPERATOR'S LABOR (6.24 HR. AT \$4.50 HR.)	28.08	8845
RETURN TO LAND AND MANAGEMENT	-45.68	-14390

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

SPRING WHEAT
CENTER PIVOT - 260 ACRES
2, 1500 GPM WELLS

COSTS	PER ACRE VALUE	TOTAL VALUE
PLOW		
HARROW		
DISC 2X	11.09	2883
FERTILIZER	1.05	273
PLANTING	6.86	1784
WEED CONTROL	27.64	7186
INSECT CONTROL	16.12	4191
HARVEST	4.00	1040
HAULING	6.25	1625
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	18.72	4867
GENERAL OVERHEAD (1% OF VARIABLE COSTS)	8.99	2337
INTEREST ON OPERATING CAPITAL (12.5%)	115.47	30023
TAXES ON LAND	10.80	2808
AMORTIZED LAND DEV. AND IMR. COSTS	14.53	3778
	6.90	1274
TOTAL COSTS	151.69	39439
INCOME	198.11	103510
55 BUSHEL AT \$3.30/BU.		
RETURN TO LAND, LABOR, AND MANAGEMENT	181.50	47190
OPERATOR'S LABOR (4 HR. AT \$4.40 HR.)	-216.61	-56320
RETURN TO LAND AND MANAGEMENT	18	4680
	-234.61	-61000

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

. SPRING WHEAT
 . SIDE ROLL - 304 ACRES
 2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
PLOW	11.09	3371
HARROW	1.05	319
DISC 2X	6.86	2085
FERTILIZER	27.64	8403
PLANTING	16.12	4900
WEED CONTROL	4.00	1216
INSECT CONTROL	6.25	1900
HARVEST	18.72	5691
HAULING	8.99	2733
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	98.96	30083
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	9.98	3034
INTEREST ON OPERATING CAPITAL (12.5%)	13.44	4087
TAXES ON LAND	4.90	1490
AMORTIZED LAND DEV. AND IRR. COSTS	131.14	39867
TOTAL COSTS	359.14	109179
INCOME		
55 BUSHEL AT \$3.30/BU.	181.50	55176
RETURN TO LAND, LABOR, AND MANAGEMENT	-177.64	-54003
OPERATOR'S LABOR (5.4 HR. AT \$4.50 HR.)	24.29	7384
RETURN TO LAND AND MANAGEMENT	-201.93	-61387

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
 DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

. SPRING WHEAT
 . SURFACE - 315 ACRES
 2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
PLOW	11.09	3493
HARROW	1.05	331
DISC 2X	6.86	2161
FERTILIZER	27.64	8707
PLANTING	16.12	5078
WEED CONTROL	4.00	1260
INSECT CONTROL	6.25	1969
HARVEST	18.72	5897
HAULING	8.99	2832
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	74.67	23522
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	8.76	2759
INTEREST ON OPERATING CAPITAL (12.5%)	11.85	3732
TAXES ON LAND	4.90	1543
AMORTIZED LAND DEV. AND IRR. COSTS	102.69	32347
TOTAL COSTS	303.59	95631
INCOME		
55 BUSHEL AT \$3.30/BU.	181.50	57173
RETURN TO LAND, LABOR, AND MANAGEMENT	-122.09	-38458
OPERATOR'S LABOR (6.04 HR. AT \$4.50 HR.)	27.17	8558
RETURN TO LAND AND MANAGEMENT	-149.26	-47017

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
 DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA SEED
CENTER PIVOT - 260 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW (WEED CONTROL) 3X	3.27	850
INSECT CONTROL	48.97	12732
WEED CONTROL	28.44	7394
DEFOLIATE	21.00	5460
HARVEST & HAUL	29.00	7540
CLEANING SEED	23.71	6165
POLINATORS	91.12	23691
INSECT MONITORING	6.00	1560
HIRED LABOR	4.50	1170
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	111.52	28995
GENERAL OVERHEAD (1% OF VARIABLE COSTS)	18.37	4776
INTEREST ON OPERATING CAPITAL (12.5%)	24.48	6365
AMORTIZED ESTABLISHMENT COSTS	30.67	7974
TAXES ON LAND	4.90	1274
AMORTIZED LAND DEV. AND IRR. COSTS	151.69	39439
TOTAL COSTS	597.64	155387
INCOME		
370 LBS. AT \$1.35/LB.	499.50	129870
RETURN TO LAND, LABOR, AND MANAGEMENT	-98.14	-25517
OPERATOR'S LABOR (1.23 HR. AT \$4.50 HR.)	5.53	1437
RETURN TO LAND AND MANAGEMENT	-103.67	-26955

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA SEED

SIDE ROLL - 304 ACRES

2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW (WEED CONTROL) 3X	3.27	994
INSECT CONTROL	48.97	14887
WEED CONTROL	28.44	8646
DEFOLIATE	21.00	6384
HARVEST & HAUL	29.00	8816
CLEANING SEED	23.71	7208
POLINATORS	91.12	27700
INSECT MONITORING	6.00	1824
HIRED LABOR	4.50	1368
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	95.61	29066
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	17.58	5344
INTEREST ON OPERATING CAPITAL (12.5%)	23.43	7124
AMORTIZED ESTABLISHMENT COSTS	30.67	9324
TAXES ON LAND	4.90	1490
AMORTIZED LAND DEV. AND IRR. COSTS	131.14	39867
TOTAL COSTS	559.35	170042
INCOME		
370 LBS. AT \$1.35/LB.	499.50	151848
RETURN TO LAND, LABOR, AND MANAGEMENT	-59.85	-18194
OPERATOR'S LABOR (2.63 HR. AT \$4.50 HR.)	11.83	3596
RETURN TO LAND AND MANAGEMENT	-71.68	-21790

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

ALFALFA SEED
SURFACE - 315 ACRES
2, 1500 GPM WELLS

	PER ACRE VALUE	TOTAL VALUE
COSTS		
HARROW (WEED CONTROL) 3X	3.27	1030
INSECT CONTROL	48.97	15426
WEED CONTROL	28.44	8959
DEFOLIATE	21.00	6615
HARVEST & HAUL	29.00	9135
CLEANING SEED	23.71	7469
POLINATORS	91.12	28703
INSECT MONITORING	6.00	1890
HIRED LABOR	4.50	1418
IRRIGATION (FUEL, REPAIR, MAINTENANCE)	71.94	22660
GENERAL OVERHEAD (5% OF VARIABLE COSTS)	16.39	5163
INTEREST ON OPERATING CAPITAL (12.5%)	21.88	6891
AMORTIZED ESTABLISHMENT COSTS	30.67	9661
TAXES ON LAND	4.90	1543
AMORTIZED LAND DEV. AND IRR. COSTS	102.69	32347
TOTAL COSTS	504.47	158909
INCOME		
370 LBS. AT \$1.35/LB.	499.50	157343
RETURN TO LAND, LABOR, AND MANAGEMENT	-4.97	-1567
OPERATOR'S LABOR (2.61 HR. AT \$4.50 HR.)	11.74	3698
RETURN TO LAND AND MANAGEMENT	-16.71	-5265

NOTE - BASED ON PRELIMINARY BUDGETS DEVELOPED BY UNIVERSITY OF NEVADA,
DIVISION OF AGRICULTURAL AND RESOURCE ECONOMICS

APPENDIX B

BUDGET SUMMARIES

COSTS AND RETURNS FOR ALFALFA - 3 CUTTINGS
USING CURRENT (1978) PRICE

		YIELDS		
		HIGH	MEDIUM	LOW
<hr/>				
ALFALFA - 3 CUTTINGS				
YIELDS -	TONS PER ACRE	5	4	3
<hr/>				
CENTER PIVOT - 2, 1500 GPM WELLS				
TOTAL COSTS		411.56	407.66	403.76
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		-126.56	-179.66	-232.76
NET RETURN		-145.41	-198.51	-251.61
 CENTER PIVOT - 3000 GPM WELL				
TOTAL COSTS		357.33	353.43	349.53
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		-72.33	-125.43	-178.53
NET RETURN		-91.18	-144.28	-197.38
 SIDE ROLL - 2, 1500 GPM WELLS				
TOTAL COSTS		370.47	366.57	362.67
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		-85.47	-138.57	-191.67
NET RETURN		-110.62	-163.72	-216.82
 SIDE ROLL - 3000 GPM WELL				
TOTAL COSTS		323.91	320.01	316.11
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		-38.91	-92.01	-145.11
NET RETURN		-64.06	-117.16	-170.26
 SURFACE - 2, 1500 GPM WELLS				
TOTAL COSTS		313.34	309.44	305.54
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		-28.34	-81.44	-134.54
NET RETURN		-56.86	-109.96	-163.06
 SURFACE - 3000 GPM WELL				
TOTAL COSTS		259.35	255.45	251.55
INCOME		285.00	228.00	171.00
RETURN (WITH LABOR)		25.65	-27.45	-80.55
NET RETURN		-2.87	-55.97	-109.07
<hr/>				

COSTS AND RETURNS FOR ALFALFA - 2 CUTTINGS
USING CURRENT (1978) PRICE

	YIELDS		
	HIGH	MEDIUM	LOW
<hr/>			
ALFALFA - 2 CUTTINGS			
YIELDS - TONS PER ACRE	3	2	1
<hr/>			
CENTER PIVOT - 2, 1500 GPM WELLS			
TOTAL COSTS	358.10	354.20	350.30
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-187.10	-240.20	-293.30
NET RETURN	-202.17	-255.27	-308.37
CENTER PIVOT - 3000 GPM WELL			
TOTAL COSTS	314.40	310.50	306.60
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-143.40	-196.50	-249.60
NET RETURN	-158.47	-211.57	-264.67
SIDE ROLL - 2, 1500 GPM WELLS			
TOTAL COSTS	320.84	316.94	313.04
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-149.84	-202.94	-256.04
NET RETURN	-171.21	-224.31	-277.41
SIDE ROLL - 3000 GPM WELL			
TOTAL COSTS	282.90	279.00	275.10
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-111.90	-165.00	-218.10
NET RETURN	-133.27	-186.37	-239.47
SURFACE - 2, 1500 GPM WELLS			
TOTAL COSTS	267.54	263.64	259.74
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-96.54	-149.64	-202.74
NET RETURN	-117.19	-170.29	-223.39
SURFACE - 3000 GPM WELL			
TOTAL COSTS	220.26	216.36	212.46
INCOME	171.00	114.00	57.00
RETURN (WITH LABOR)	-49.26	-102.36	-155.46
NET RETURN	-69.91	-123.01	-176.11

COSTS AND RETURNS FOR SPRING WHEAT

USING CURRENT (1978) PRICE

		YIELDS		
		HIGH	MEDIUM	LOW
<hr/>				
SPRING WHEAT				
YIELDS -	BU. PER ACRE	80	60	40
<hr/>				
CENTER PIVOT - 2, 1500 GPM WELLS				
TOTAL COST		398.11	398.11	398.11
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		-130.91	-197.71	-264.51
NET RETURN		-148.91	-215.71	-282.51
CENTER PIVOT - 3000 GPM WELL				
TOTAL COST		350.59	350.59	350.59
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		-83.39	-150.19	-216.99
NET RETURN		-101.39	-168.19	-234.99
SIDE ROLL - 2, 1500 GPM WELLS				
TOTAL COST		359.14	359.14	359.14
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		-91.94	-158.74	-225.54
NET RETURN		-116.23	-183.03	-249.83
SIDE ROLL - 3000 GPM WELL				
TOTAL COST		318.05	318.05	318.05
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		-50.85	-117.65	-184.45
NET RETURN		-75.14	-141.94	-208.74
SURFACE - 2, 1500 GPM WELLS				
TOTAL COST		303.59	303.59	303.59
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		-36.39	-103.19	-169.99
NET RETURN		-63.56	-130.36	-197.16
SURFACE - 3000 GPM WELL				
TOTAL COST		253.87	253.87	253.87
INCOME		267.20	200.40	133.60
RETURN (WITH LABOR)		13.33	-53.47	-120.27
NET RETURN		-13.84	-80.64	-147.44
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COSTS AND RETURNS FOR POTATOES
USING CURRENT (1978) PRICE

	YIELDS		
	HIGH	MEDIUM	LOW
<hr/>			
POTATOES			
YIELDS - CWT. PER ACRE	400	325	275
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CENTER PIVOT - 2, 1500 GPM WELLS			
TOTAL COST	1063.31	1063.31	1063.31
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	136.69	-88.31	-238.31
NET RETURN	119.41	-105.59	-255.59
CENTER PIVOT - 3000 GPM WELL			
TOTAL COST	1027.90	1027.90	1027.90
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	172.10	-52.90	-202.90
NET RETURN	154.82	-70.18	-220.18
SIDE ROLL - 2, 1500 GPM WELLS			
TOTAL COST	1028.74	1028.74	1028.74
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	171.26	-53.74	-203.74
NET RETURN	147.68	-77.32	-227.32
SIDE ROLL - 3000 GPM WELL			
TOTAL COST	997.57	997.57	997.57
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	202.43	-22.57	-172.57
NET RETURN	178.85	-46.15	-196.15
SURFACE - 2, 1500 GPM WELLS			
TOTAL COST	977.60	977.60	977.60
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	222.40	-2.60	-152.60
NET RETURN	194.32	-30.68	-180.68
SURFACE - 3000 GPM WELL			
TOTAL COST	935.60	935.60	935.60
INCOME	1200.00	975.00	825.00
RETURN (WITH LABOR)	264.40	39.40	-110.60
NET RETURN	236.32	11.32	-138.68
<hr/>			

COSTS AND RETURNS FOR ALFALFA SEED

USING CURRENT (1978) PRICE

	YIELDS		
	HIGH	MEDIUM	LOW
ALFALFA SEED			
YIELDS - CWT. PER ACRE	5	4	3
CENTER PIVOT - 2, 1500 GPM WELLS			
TOTAL COST	597.64	597.64	597.64
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	77.36	-57.64	-192.64
NET RETURN	71.83	-63.17	-198.17
CENTER PIVOT - 3000 GPM WELL			
TOTAL COST	551.98	551.98	551.98
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	123.02	-11.98	-146.98
NET RETURN	117.49	-17.51	-152.51
SIDE ROLL - 2, 1500 GPM WELLS			
TOTAL COST	559.35	559.35	559.35
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	115.65	-19.35	-154.35
NET RETURN	103.82	-31.18	-166.18
SIDE ROLL - 3000 GPM WELL			
TOTAL COST	519.78	519.78	519.78
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	155.22	20.22	-114.78
NET RETURN	143.39	8.39	-126.61
SURFACE - 2, 1500 GPM WELLS			
TOTAL COST	504.47	504.47	504.47
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	170.53	35.53	-99.47
NET RETURN	158.79	23.79	-111.21
SURFACE - 3000 GPM WELL			
TOTAL COST	455.93	455.93	455.93
INCOME	675.00	540.00	405.00
RETURN (WITH LABOR)	219.07	84.07	-50.93
NET RETURN	207.33	72.33	-62.67

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